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EXAMINER
HAILU, KIBROM T

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/816,385	SUN ET AL.
	Examiner	Art Unit	
	KIBROM T. HAILU	2461	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>03 November 2010</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-21,50 and 51</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-21,50 and 51</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>01 April 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

U.S. Patent and Trademark Office

PTOL-326 (Rev. 08-06)   **Office Action Summary**   Part of Paper No./Mail Date 20110301

DETAILED ACTION

Response to Arguments

1.   Applicants' arguments with respect to claims 1-21 and 50-51 have been considered but

are moot in view of the new ground(s) of rejection based on the 112 first and second paragraphs.

However, the Applicants' arguments on page 7-12 of the REMARKS are not persuasive

in view of the following disclosure, and therefore, the claims are not patentable.

First, the Applicants argue that Christodoulides is devoid of any description or suggestion

that the UW frame synchronization symbols are added **after** the code word is mapped to the

signal constellation. The Examiner respectfully disagrees because, as explained in the previous

Office Action, the claims do not suggest either. As it is also described in the previous Office

Action, the synchroniser 30 of Christodoulides simply provides four bits of the frame or the UW

to the modulator because the modulator is 16 QAM modulator. If synchronization is achieved

before the UW is mapped by the modulator, then there is no need for the modulator. In fact, the

UW is detected at the receiver to acquire the timing and phase of the received signal, therefore it

is clear that the UW is added to assist the synchronization (please fig. 2b and read col. 4, lines

32-37. Please also compare this with paragraph paragraphs [0035]; [0048]; [0053] and [0084] of

the current application). Therefore, the argument that, in Christodoulides, synchronization is

achieved before the addition of UW is not persuasive although it is not claimed that way.

Second, the Applicants argue, "Mowbray discloses de-multiplexer 14 ... distributes

successive portions of a packet for transmission along each of two paths 16 and 18 **alternately**.

Thus, the de-multiplexer 14 breaks the input data packet into successive portions that are

alternately distributed through two different data paths. For example, one path carries odd

numbered portions and the other path carries even numbered portions in an alternating back and forth distribution of successive portions of the input data packet." Well, the Examiner respectfully disagrees with the above Applicants' analysis. Mowbray doesn't describe the example, namely the odd and even numbered portions, given by the Applicants. Even by definition, "successive portions ... alternately" cannot be interpreted as, and/or assumed to be, even and odd numbered portions. It can even be read from the abstract and col. 3, lines 48-52 that a packet is divided or de-multipled into sub-packets and multiplexed or interleaved into a complete packet at multiplexer 28 before outputting the complete packet. Therefore, the word alternately is simply occurring in a successive manner, and Mowbray clearly describes the two divided successive sub-packets are transmitted simultaneously. Then, as indicated above, the two sub-frames are interleaved into the complete packet by the multiplexer 28.

The Applicants further argue, "if Mowbray's multiplexer is used upstream of Miyoshi's duplicating section 11, then only one-half of the data stream that is input to Mowbray's multiplexer 14 would be output to Miyoshi's duplicating section 11, while the other half of the data stream (i.e., the alternate successive portions) input to Mowbray's multiplexer 14 would be lost. The combination of Mowbray and Miyoshi therefore does not disclose the recitations of step (2) of 'duplicating and demultiplexing the data stream into a first data stream and a second data stream that are the same as each other.'" Well, if the Applicants believe that this is the case, then the Examiner requests the Applicants to explain the limitation "duplicating and demultiplexing the data stream into a first data stream and a second data stream that are the same as each other" in view or in light of the specification.

Third, the Applicants argue, "Miyoshi operates oppositely to the claimed sequence of

steps (1) and (2) because the bit sequence is duplicated (duplicating section 110) and **then** the

duplicated bit sequences are mapped to separate signal constellations (modulating section 12)."

As explained above, the mapping the codeword step is already taught by Christodoulides.

Therefore, what is needed is to modify Christodoulides by the duplicating section of Miyoshi.

As per the Raleigh's reference, the first data (which in this case Quadrature data) is

multiplied by the predetermined constant i, and the two are combined after the first data is

multiplied by the constant i. And, combining the two is nothing but multiplexing.

Therefore, the Applicants' arguments are not persuasive and the claimed invention is not

patentable.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making
> and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it
> pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode
> contemplated by the inventor of carrying out his invention.

3.   Claims 1-21 and 50-51 are rejected under 35 U.S.C. 112, first paragraph, as failing to

comply with the written description requirement. The claim(s) contains subject matter which

was not described in the specification in such a way as to reasonably convey to one skilled in the

relevant art that the inventor(s), at the time the application was filed, had possession of the

claimed invention.

Regarding claims 1, 5-6, 12 and 16-17, the limitation, "… a first data stream and a

second data stream that are the same as each other" amended on July 26, 2010 is not described in

the specification. The Examiner carefully read the specification, but there is no where in the spec

that the two data streams are the same. In the previous Office Action, the Examiner overlooked

the limitation. Appropriate correction is required.

   Claims 2-4, 7-11, 13-15, 18-21 and 50-51, the claims are rejected due to their

dependency.

4.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

5.   Claims 1-21 and 50-51 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

   Regarding claim 1 and 5-6, the limitation "duplicating and demultiplexing the data

stream into a first data stream and a second data stream that are the same as each other" is not

clear it is not clear. The Examiner cannot determine what has been claimed. First, according to

the specification and the art, demultiplexing data stream is dividing or splitting the data stream.

If that is the case, how can the two divided data streams be the same to each other? Second, how

can the data stream be duplicated into the first and second data streams?

   The claims also recited the limitation, "modifying the first data stream according to a

predetermined operation". This limitation is also unclear because one can assume the

predetermined operation as constants "0" and "1". If that is the case, how a frame

synchronization structure would be formed?

   Regarding claim 12 and 16-17, the limitation "demultiplexing the data stream into a

first data stream and a second data stream that are the same as each other" is not clear it is not

clear. The Examiner cannot determine what has been claimed. First, according to the

specification and the art, demultiplexing data stream is dividing or splitting the data stream. If

that is the case, how can the two divided data streams be the same to each other?

The claims also recited the limitation, "a multiplier coupled to the constellation mapper

and configured to modify the first data stream". This limitation is also unclear because one can

assume the multiplier as constants "0" and "1". If that is the case, how a frame synchronization

structure would be formed?

Claims 2-4, 7-11, 13-15, 18-21 and 50-51, the claims are rejected due to their

dependency.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

7.   The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness
       or nonobviousness.

8.   Claims 1-2, 4, 9-10, 11-13, 15, 20-21 and 50-51 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Christodoulides et al. (US 6.665,361 B1) in view of Mowbray et al. (US

6,119,263), and further in view of Miyoshi et al. (US 7,372,908 B2) and Raleigh et al. (US

6,158,041).

   Regarding claims 1-2, 4, 10, 13, and 21, Christodoulides discloses a method for

supporting frame synchronization in a digital communication system (col. 4, lines 16-19), the

method comprising the steps of: mapping a codeword specifying framing information of a frame

according to a signal constellation to output a data stream (Fig. 5; col. 5, lines 43-48, 56-58); and

outputting a physical layer signaling header corresponding to the frame based on the multiplexed

data streams (col. 1, lines 61-67; col. 4, lines 1-6; col. 5, lines 51-52; col. 5, line 66-col. 6, line

10).

   Christodoulides doesn't disclose duplicating and demultiplexing the data stream into a

first data stream and a second data stream that are the same as each other, modifying the first

data stream according to a predetermined operation; multiplexing the modified first data stream

with the second data stream to form a frame synchronization structure in the multiplexed data

streams; and the constellation is independent of a modulation scheme of the frame.

   Mowbray teaches demultiplexing the data stream into a first data stream and a second

data stream (Fig. 1; col. 3, lines 6-15). However, Mowbray doesn't teach the demultiplexed

packets are duplicating packets; modifying the first data stream according to a predetermined

operation; multiplexing the modified first data stream with the second data stream.

   Miyoshi teaches the demultiplexed packets are duplicating packets that are the same as

each other, and the constellation (such as BPSK) is independent of a modulation scheme of the

frame (Fig. 1, 19; abstract; col. 2, lines 43-67; col. 4, line 56-col. 5, line 6).

Miyoshi doesn't explicitly teach modifying the first data stream according to a predetermined operation; multiplexing the modified first data stream with the second data stream to form a frame synchronization structure in the multiplexed data streams.

Raleigh teaches modifying the first data stream according to a predetermined operation (Fig. 2; col. 4, lines 61-64, illustrates the first data stream is modified by multiplying the value i by the multiplier 222); multiplexing the modified first data stream with the second data stream to form a frame synchronization structure in the multiplexed data streams (Fig. 2; col. 4, line 65-col. 5, line 1; col. 8, lines 33-44; explains the first data stream modified by multiplier 222 and the second data stream are combined or multiplexed by the summer 224 and the combined output is interleaved by interleaver, and it is clear that transmitted symbol stream assists the receiver to synchronize with the tranmitter).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate duplicating and demultiplexing the data stream into a first data stream and a second data stream, and the constellation is independent of a modulation scheme of the frame, modifying the first data stream according to a predetermined operation; multiplexing the modified first data stream with the second data stream to form a frame synchronization structure in the multiplexed data streams as taught by Mowbray, Miyoshi and Raleigh into the satellite communication of Christodoulides in order to improve the speed of higher-capacity networks that require higher-speed and to be able to reconfigure the amount of information which can be transmitted on the channel within the available transmission frames that maximizes message throughput on the channel, capable of improving reception quality

without performing transmission and retransmission, and the decoder would not be overwhelmed with successive errors, thus optimize performance and avoid degrading the system.

Regarding claim 9 and 20, Chrisodoulides discloses scrambling the multiplexed data streams (col. 4, lines 3-6).

Regarding claims 11-12 and 15, the same rejections to claims 1 and 4 are applicable hereto. The claims are just mere reformulation of claim 1 and 4 in order to define the corresponding computer-readable medium and apparatus.

Regarding claims 50-51, Chrisodoulides discloses the data stream includes a unique word to assist with synchronization (col. 4, lines 16-19).

9.   Claims 3 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christodoulides in view of Mowbray, Miyoshi, and Raleigh, as applied to claims 1 and 12 above, further in view of Mpgre et al. (US 2004/0047433 A1).

Christodoulides discloses a frame format for satellite communication (abstract). Christodoulides doesn't disclose the frame is a Low Density Parity Check (LDPC) coded frame.

Mogre teaches the frame is a Low Density Parity Check (LDPC) coded frame (paragraph [0018]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use LDPC frame format of Mogre in the modified satellite communiation of Christodoulides to efficiently transmit broadband service content using the LDPC that may operate efficiently and effectively using preexisting bandwidth allocated, and avoid attenuation problems when broadcast at preexisting transmission power level.

10.   Claims 5-6 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Christodoulides in view of Mowbray, Miyoshi and Raleigh, and further in view of Gardner (US

5,627,499).

        The claims include features corresponding to subject matter mentioned above to the

rejected claim 1 except a sign of the multiplier represents a portion of the framing information,

bits of the first data stream are interleaved with respective additional bits, the additional bits

being phase rotated relative to the bits of the first data stream during modulation.

        However, Gardner teaches a sign of the multiplier represents a portion of the framing

information, bits of the first data stream are interleaved with respective additional bits, the

additional bits being phase rotated relative to the bits of the first data stream during modulation

(Figs. 2 and 3; col. 4, lines 31-59, illustrates "...the effect of adding multiple 90 degrees to the 8-

bit digital representation of the in-phase...bit in the shift register is a logical one, the counter

increments the phase by 90 degrees. Alternatively, when the oldest bit in the shift register is a

logical zero, the counter decrements the phase by 90 degrees, and rotating the bits by multiples

of 90 degrees).

        Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to use a sign of the multiplier represents a portion of the framing

information, bits of the first data stream are interleaved with respective additional bits, the

additional bits being phase rotated relative to the bits of the first data stream during modulation

Gardner into the modified satellite communication of Christodoulides in order to be able to

reconfigure the amount of information which can be transmitted on the channel within the

available transmission frames that maximizes message throughput on the channel, to reduce size

and cost of a circuit.

11.   Claims 7 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Christodoulides in view of Mowbray, Miyoshi, and Raleigh, as applied to claims 1 and 12 above,

further in view of Kim et al. (US 6,851,085 B2).

The modified to the satellite communication of Christodoulides discloses generating the

codeword or unique word according to turbo or convolutional code. However, Christodoulides

doesn't disclose generating the codeword according to a first order Reed-Muller code.

Kim teaches generating the codeword according to a first order Reed-Muller code (col. 2,

lines 24-36).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to use the first order Reed-Muller code to generate codeword as taught by

Kim in to the satellite communication of Christodoulides so that a smaller and simplified

hardware would be used to generate the codeword at different coding rates, that is, for the input

of different information bits reduces the number of required encoders, simplifies the encoder and

decoder structure, and as a consequence, decreases their size.

12.   Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Christodoulides in view of the satellite communication of Mowbray, Miyoshi, and Raleigh, as

applied to claims 1 and 12 above, further in view of Love et al. (US 7,158,482 B2).

The modified satellite communication of Crhrisodoulides discloses the framing

information. However, the modified satellite communication of Chrisodoulides doesn't explicitly

the framing information specifies a modulation scheme, and a coding scheme.

Love teaches the framing information specifies a modulation scheme, and a coding

scheme (Fig. 4; col. 5, lines 55-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to incorporate framing information or field indicating modulation and

coding schemes as taught by Love into the modified satellite communication of Chrisodoulides

in order to improve data throughput of the system, and properly demodulate and decode the data

streams.

Conclusion

13.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to KIBROM T. HAILU whose telephone number is (571)270-1209.

The examiner can normally be reached on Monday-Thursday 8:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Huy D. Vu can be reached on (571)272-3155. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kibrom T Hailu/

Examiner, Art Unit 2461

/Huy D Vu/

Supervisory Patent Examiner, Art Unit 2461